

# SEQUENCE LISTING

<110> CALLEN, Walter

<120> XYLOSE ISOMERASES, NUCLEIC ACIDS ENCODING THEM AND METHODS FOR MAKING AND USING THEM

<130> 564462005501

<140> US 10/533,241

<141> 2003-10-23

<150> PCT/US03/34008

<151> 2003-10-23

<150> US 60/424,649

<151> 2002-11-06

<160> 4

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 1335

<212> DNA

<213> unknown

<220>

<223> obtained from an environmental sample

<400> 1

atgactgagt	tctttccaga	gatcccgaag	atacagtttg	aaggtaaaga	gagcacaat	60
ccatttgcgt	tcaagttcta	cgatccaaac	gaggtgatcg	acggaaaacc	tctcaaggac	120
catctgaagt	tctcagttgc	attctggcac	accttcgtga	acgaggggag	agatcccttc	180
ggagatccaa	cagccgaccg	accctggaac	aagtacacag	accctatgga	caaagccttt	240
gcaaggggtg	acgccctctt	tgaattctgt	gaaaaactca	acatcgagta	cttctgtttt	300
cacgacaggg	acatagctcc	tgaaggaaag	actctgaggg	agacaaacaa	gatcctggac	360
aaggctcgtg	agaggatcaa	agagagaatg	aaagacagca	acgtaaaact	cctctggggg	420
actgcaatc	tcttttctca	tccaaggtac	atgcacggtg	cggcgacaac	ctgtagtgt	480
gatgtcttcg	cctacgcggc	agcacagggt	aagaaagccc	ttgagatcac	aaaagagctt	540
ggaggagaag	ggtacgtctt	ttgggggtgga	agagaagggg	acgagacact	cctcaacacg	600
gatctggatc	ttgaacttgg	aaacctcgct	cgcttctctca	gaatggctgt	ggattacgca	660
aagaagatag	gtttcaacgg	ccagtttctc	atcgagccta	aaccgaagga	accaacgaag	720
catcagtacg	acttcgatgt	tgcgacggct	tacgccttcc	tgaagagtca	cggtctcgat	780
gagtatttca	aattcaacat	cgaagcgaac	catgccacac	ttgctgggtca	caccttccag	840
cacgaactga	ggatggcaag	aattcttggga	aaactcggca	gcatcgacgc	gaaccagggg	900
gaccttctgc	tcggctggga	caccgaccag	ttcccaacaa	acgtctacga	cacaactctt	960
gccatgtatg	aagtataaaa	agcgggtggg	tttacaaaag	gtgggtctcaa	cttcgatgca	1020
aaggtagagaa	gagcttctta	caagggtggaa	gatctcttca	tcgggcacat	agcaggaatg	1080
gatactttcg	cactcgggtt	caaaatagcc	cacaaacttg	taaaagacgg	tgtgttcgac	1140
aagttcattg	aagaaaaata	caaaagtctc	agagaggggca	tcggaaaaga	gatcggttgaa	1200
ggaaaggcag	attttgaaaa	gctggaagct	tatataatag	acaaggaaga	gatggagctt	1260
ccatctggaa	agcaggagta	tttggaaggt	ctcctcaaca	gctacatagt	gaaaacgatc	1320
tccgagttga	ggtga					1335

<210> 2

<211> 444

<212> PRT

<213> unknown

<220>

<223> obtained from an environmental sample

<400> 2

Met	Thr	Glu	Phe	Phe	Pro	Glu	Ile	Pro	Lys	Ile	Gln	Phe	Glu	Gly	Lys
1				5					10					15	
Glu	Ser	Thr	Asn	Pro	Phe	Ala	Phe	Lys	Phe	Tyr	Asp	Pro	Asn	Glu	Val
			20					25					30		
Ile	Asp	Gly	Lys	Pro	Leu	Lys	Asp	His	Leu	Lys	Phe	Ser	Val	Ala	Phe
		35					40					45			
Trp	His	Thr	Phe	Val	Asn	Glu	Gly	Arg	Asp	Pro	Phe	Gly	Asp	Pro	Thr
	50				55					60					
Ala	Asp	Arg	Pro	Trp	Asn	Lys	Tyr	Thr	Asp	Pro	Met	Asp	Lys	Ala	Phe
65					70				75						80
Ala	Arg	Val	Asp	Ala	Leu	Phe	Glu	Phe	Cys	Glu	Lys	Leu	Asn	Ile	Glu
				85					90					95	
Tyr	Phe	Cys	Phe	His	Asp	Arg	Asp	Ile	Ala	Pro	Glu	Gly	Lys	Thr	Leu
			100					105					110		
Arg	Glu	Thr	Asn	Lys	Ile	Leu	Asp	Lys	Val	Val	Glu	Arg	Ile	Lys	Glu
		115					120					125			
Arg	Met	Lys	Asp	Ser	Asn	Val	Lys	Leu	Leu	Trp	Gly	Thr	Ala	Asn	Leu
	130				135						140				
Phe	Ser	His	Pro	Arg	Tyr	Met	His	Gly	Ala	Ala	Thr	Thr	Cys	Ser	Ala
145					150				155						160
Asp	Val	Phe	Ala	Tyr	Ala	Ala	Ala	Gln	Val	Lys	Lys	Ala	Leu	Glu	Ile
				165				170						175	
Thr	Lys	Glu	Leu	Gly	Gly	Glu	Gly	Tyr	Val	Phe	Trp	Gly	Gly	Arg	Glu
			180					185					190		
Gly	Tyr	Glu	Thr	Leu	Leu	Asn	Thr	Asp	Leu	Asp	Leu	Glu	Leu	Gly	Asn
		195				200						205			
Leu	Ala	Arg	Phe	Leu	Arg	Met	Ala	Val	Asp	Tyr	Ala	Lys	Lys	Ile	Gly
	210				215						220				
Phe	Asn	Gly	Gln	Phe	Leu	Ile	Glu	Pro	Lys	Pro	Lys	Glu	Pro	Thr	Lys
225					230					235					240
His	Gln	Tyr	Asp	Phe	Asp	Val	Ala	Thr	Ala	Tyr	Ala	Phe	Leu	Lys	Ser
				245				250						255	
His	Gly	Leu	Asp	Glu	Tyr	Phe	Lys	Phe	Asn	Ile	Glu	Ala	Asn	His	Ala
			260					265					270		
Thr	Leu	Ala	Gly	His	Thr	Phe	Gln	His	Glu	Leu	Arg	Met	Ala	Arg	Ile
		275					280					285			
Leu	Gly	Lys	Leu	Gly	Ser	Ile	Asp	Ala	Asn	Gln	Gly	Asp	Leu	Leu	Leu
	290				295						300				
Gly	Trp	Asp	Thr	Asp	Gln	Phe	Pro	Thr	Asn	Val	Tyr	Asp	Thr	Thr	Leu
305					310					315					320
Ala	Met	Tyr	Glu	Val	Ile	Lys	Ala	Gly	Gly	Phe	Thr	Lys	Gly	Gly	Leu
				325				330						335	
Asn	Phe	Asp	Ala	Lys	Val	Arg	Arg	Ala	Ser	Tyr	Lys	Val	Glu	Asp	Leu
			340					345					350		
Phe	Ile	Gly	His	Ile	Ala	Gly	Met	Asp	Thr	Phe	Ala	Leu	Gly	Phe	Lys
		355					360					365			
Ile	Ala	His	Lys	Leu	Val	Lys	Asp	Gly	Val	Phe	Asp	Lys	Phe	Ile	Glu
	370					375					380				
Glu	Lys	Tyr	Lys	Ser	Phe	Arg	Glu	Gly	Ile	Gly	Lys	Glu	Ile	Val	Glu
385					390					395					400
Gly	Lys	Ala	Asp	Phe	Glu	Lys	Leu	Glu	Ala	Tyr	Ile	Ile	Asp	Lys	Glu
				405					410					415	
Glu	Met	Glu	Leu	Pro	Ser	Gly	Lys	Gln	Glu	Tyr	Leu	Glu	Ser	Leu	Leu
			420					425					430		
Asn	Ser	Tyr	Ile	Val	Lys	Thr	Ile	Ser	Glu	Leu	Arg				
		435					440								

<210> 3

<211> 1335

<212> DNA

<213> unknown

<220>

<223> obtained from an environmental sample

<400> 3

atgacagaat	ttttcccgga	aattccaaag	atacagttcg	aagggaagga	aagcaataac	60
cctcttgcc	ttaagttcta	cgatccagac	gaagtaatcg	atggaaaacc	tctgaaggac	120
catttgaaat	tctccgttgc	tttctggcac	acttttgtaa	acgaaggtcg	agatcccttc	180
ggtgacccca	ctgctgaaaag	accctggaac	aagtattcgg	atcccatgga	caaagcggtt	240
gcaagagtgg	atgctttatt	cgaattctgt	gagaaactca	atattgaata	cttttgtttt	300
catgacagag	acattgcacc	cgaagggaaa	actctgagag	agacgaacaa	aattctggac	360
aaagtgtgtg	agaaaataaa	agaacgaatg	aaggaaagca	atgtgaaact	cctttgggga	420
actgccaatc	tgttctcaca	tcctcggtag	atgcacggtg	cggcaactac	ttgcagcgcc	480
gatgtttttg	catacgtctg	tgcacaggtg	aaaaaagcgt	tggaagattac	gaaggaactt	540
ggaggagaag	gatatgtttt	ttggggcggt	agagaaggat	acgaaacctt	gctcaacacg	600
gatttgggat	tggaactcga	aaacctcgcg	aggttcctca	gaatggccgt	agagtacgca	660
aagaagatag	gttttgatgg	acagttcctc	atagaacca	aaccaaaga	acccacaaaa	720
catcagtag	atttcgacgt	agcgaccgca	tacgccttct	tgaaaactca	cgatttggat	780
gaataacttca	agttcaacat	agaagcta	cacgcaacac	tcgctggtca	tactttccag	840
catgaattga	gaatggccag	aatcctcgga	aaattcggaa	gtatcgacgc	aatcaaggc	900
gatcttctgt	tgggatggga	caccgatcaa	tttccaacga	acgtatacga	tacaactctt	960
gccatgtacg	agggtataaaa	agcagggggt	ttcacaaaag	gtggtctcaa	cttcgacgcc	1020
aaagtgagac	gtgcttctta	caaggtagag	gatctcttca	tcgggcatat	agtaggaata	1080
gacactttcg	cactcggttt	caagatagcc	tacaaacttg	taaaagacgg	cgtattcgac	1140
agattcggtg	aggaaaaata	cagaagtttc	agagaaggta	ttggaaaaga	aatattggaa	1200
ggaaaagcag	attttgaaaa	actagaatcg	tatataatag	acaaagaaga	tggtgaactt	1260
ccatctggaa	aacaggagta	tcttgaaagt	ttgctcaaca	gctatatcgt	gaagaccgta	1320
tcagaactga	ggtga					1335

<210> 4

<211> 444

<212> PRT

<213> unknown

<220>

<223> obtained from an environmental sample

<400> 4

Met	Thr	Glu	Phe	Phe	Pro	Glu	Ile	Pro	Lys	Ile	Gln	Phe	Glu	Gly	Lys
1				5					10					15	
Glu	Ser	Asn	Asn	Pro	Leu	Ala	Phe	Lys	Phe	Tyr	Asp	Pro	Asp	Glu	Val
			20					25					30		
Ile	Asp	Gly	Lys	Pro	Leu	Lys	Asp	His	Leu	Lys	Phe	Ser	Val	Ala	Phe
		35					40					45			
Trp	His	Thr	Phe	Val	Asn	Glu	Gly	Arg	Asp	Pro	Phe	Gly	Asp	Pro	Thr
	50					55					60				
Ala	Glu	Arg	Pro	Trp	Asn	Lys	Tyr	Ser	Asp	Pro	Met	Asp	Lys	Ala	Phe
65					70				75					80	
Ala	Arg	Val	Asp	Ala	Leu	Phe	Glu	Phe	Cys	Glu	Lys	Leu	Asn	Ile	Glu
				85					90					95	
Tyr	Phe	Cys	Phe	His	Asp	Arg	Asp	Ile	Ala	Pro	Glu	Gly	Lys	Thr	Leu
			100					105					110		
Arg	Glu	Thr	Asn	Lys	Ile	Leu	Asp	Lys	Val	Val	Glu	Lys	Ile	Lys	Glu
		115					120						125		
Arg	Met	Lys	Glu	Ser	Asn	Val	Lys	Leu	Leu	Trp	Gly	Thr	Ala	Asn	Leu
	130					135					140				
Phe	Ser	His	Pro	Arg	Tyr	Met	His	Gly	Ala	Ala	Thr	Thr	Cys	Ser	Ala
145					150				155					160	
Asp	Val	Phe	Ala	Tyr	Ala	Ala	Ala	Gln	Val	Lys	Lys	Ala	Leu	Glu	Ile
				165				170						175	
Thr	Lys	Glu	Leu	Gly	Gly	Glu	Gly	Tyr	Val	Phe	Trp	Gly	Gly	Arg	Glu
			180				185						190		
Gly	Tyr	Glu	Thr	Leu	Leu	Asn	Thr	Asp	Leu	Gly	Leu	Glu	Leu	Glu	Asn
		195				200						205			
Leu	Ala	Arg	Phe	Leu	Arg	Met	Ala	Val	Glu	Tyr	Ala	Lys	Lys	Ile	Gly
	210					215					220				

Phe	Asp	Gly	Gln	Phe	Leu	Ile	Glu	Pro	Lys	Pro	Lys	Glu	Pro	Thr	Lys
225					230					235					240
His	Gln	Tyr	Asp	Phe	Asp	Val	Ala	Thr	Ala	Tyr	Ala	Phe	Leu	Lys	Thr
				245					250						255
His	Asp	Leu	Asp	Glu	Tyr	Phe	Lys	Phe	Asn	Ile	Glu	Ala	Asn	His	Ala
			260					265					270		
Thr	Leu	Ala	Gly	His	Thr	Phe	Gln	His	Glu	Leu	Arg	Met	Ala	Arg	Ile
		275					280					285			
Leu	Gly	Lys	Phe	Gly	Ser	Ile	Asp	Ala	Asn	Gln	Gly	Asp	Leu	Leu	Leu
	290					295					300				
Gly	Trp	Asp	Thr	Asp	Gln	Phe	Pro	Thr	Asn	Val	Tyr	Asp	Thr	Thr	Leu
305					310					315					320
Ala	Met	Tyr	Glu	Val	Ile	Lys	Ala	Gly	Gly	Phe	Thr	Lys	Gly	Gly	Leu
				325					330					335	
Asn	Phe	Asp	Ala	Lys	Val	Arg	Arg	Ala	Ser	Tyr	Lys	Val	Glu	Asp	Leu
			340					345					350		
Phe	Ile	Gly	His	Ile	Val	Gly	Ile	Asp	Thr	Phe	Ala	Leu	Gly	Phe	Lys
		355					360					365			
Ile	Ala	Tyr	Lys	Leu	Val	Lys	Asp	Gly	Val	Phe	Asp	Arg	Phe	Val	Glu
	370					375					380				
Glu	Lys	Tyr	Arg	Ser	Phe	Arg	Glu	Gly	Ile	Gly	Lys	Glu	Ile	Leu	Glu
385					390					395					400
Gly	Lys	Ala	Asp	Phe	Glu	Lys	Leu	Glu	Ser	Tyr	Ile	Ile	Asp	Lys	Glu
				405					410					415	
Asp	Val	Glu	Leu	Pro	Ser	Gly	Lys	Gln	Glu	Tyr	Leu	Glu	Ser	Leu	Leu
			420					425					430		
Asn	Ser	Tyr	Ile	Val	Lys	Thr	Val	Ser	Glu	Leu	Arg				
		435					440								